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Carter and Research: An Excess of Caution?

Characteristically atop the news, SGR has diligently chronicled the Carter Administration's frequent statements of generous intent toward science and technology, and, in particular, its commitment to put some real growth — approximately five per cent annually — into the purchasing power of basic research.

The Administration's words and deeds are laudable, and we have lauded them. But, with the Administration now approaching the completion of its second year in power, SGR is compelled to take note of a questionable theme in an otherwise agreeable melody. What we're referring to, specifically, is the growing dominance of caution, conservatism and, perhaps, just plain timidity in committing the federal government to research endeavors. Given the many scorching episodes of the past — e.g., Mohole, the National Cancer Program and an assortment of crackpot military R&D ventures — it is not to be doubted that prudence ought to prevail in spending R&D funds that the government comandeers

Science Foundation, which, at Carter's direction, took over the legislatively prescribed task from his overworked White House Office of Science and Technology Policy. But the report also includes a "Strategic Overview" that is attributed to OSTP, and, to the extent that the Administration is showing its thinking on R&D matters, that overview now stands as the crucial statement.

And, what do we have here, apart from the traditional listing of a flock of recent scientific developments? What we find is a confession of puzzlement and caution about the social value of science and technology, along with many reminders that research really isn't all that it's usually cracked up to be in solving social problems. "We are coming to realize," the overview states, "that science and technology by themselves are often inadequate to insure enhanced social welfare."

Now, since it has been a long time since even the most fervent science addict has claimed that science and technology *by themselves* could do anything useful, one wonders just when it was that the authors secluded themselves from the real world; or why, when they are

(Continued on Page 2)

NIH Budget Details -- Page 8

from an increasingly restive public. But the worship of prudence, which is a hallmark of this Administration, can easily be transformed into a kind of risk-avoiding immobilization, and, what we wish to suggest is that the policies of the Administration are now tending in that direction. To put it bluntly, the Administration, in its obsession with minding the pennies, is firmly squeezing the innovative bounce out of R&D; it is making it harder than ever for research managers and scientists to risk resources on high-payoff gambles, and, in short, it is — in the name of economy and responsible management — inhibiting a national resource that has no apologies to make for being allowed some *laissez faire* in its internal management.

In support of this dour assessment, we first turn to a rather remarkable new document in the literature of science and government, the first issue of the President's *Science and Technology Report*, which Carter, as mandated by the National Science and Technology Act of 1976, recently sent to Congress. Though we examined some aspects of this document in the last issue of SGR, the subject is worth turning to again, if only to spur our lagging journalistic colleagues, as well as the scientific community at large, to dig in and understand what's being said by this Administration.

Most of the report was written by the National

In Brief

The Rev. Sun Myung Moon's Seventh International Conference on the Unity of the Sciences is scheduled for November 24-26 in Boston, with the official program listing, as usual, many scholarly eminences, among them Eugene P. Wigner, the Nobel physicist from Princeton, and Frederick Seitz, recently retired President of Rockefeller University. Topic this year: "The Re-Evaluation of Existing Values and the Search for Absolute Values."

Engineering enrollments are booming again, with the current freshman class totaling a record 88,780, according to the Engineering Manpower Commission. The explanation is in the job market: Last year, only four per cent of graduates at all levels had neither a job offer nor plans upon completing their studies.

Left Undone When Congress Adjourned: House action on the creation of a Department of Education, which passed the Senate, 72-11, in September. That version called for putting most of NSF's science education programs in the new department, with the exception of graduate research training. The House opposition is strong and serious and the fate of the proposed department doesn't look especially bright at this point.

... Economizing the Dominant Theme in R&D

(Continued from Page 1)

the government's voice of science they are assuming a stance that even modern day Luddites would find stale.

"As a result," the report continues, "we are now more cautious and more sophisticated in our assessment of technology. We now demand critical analyses of what an advance can and cannot be expected to do, in what time frame, and with what cultural implications. And we try to count the costs as well as the benefits. Indeed, our frame of reference has expanded so that we often try to assess the distant effects of a new technology — economic, environmental, and social — before the technology has even been shown to be workable."

These lines, of course, pay court to the new great god on the Washington R&D scene, technology assessment. But, curiously, there's no concession to the fact that technology assessment is still a rather primitive art form — getting better, it must be admitted — and that efforts to foresee the consequences of new technologies can be misleading as well as revealing. They can also be very dampening for the spirit of innovation, but nowhere in the overview is that aspect of the problem addressed.

The emphasis on caution that flavors the *Science and Technology Report* is also to be found in Carter's recently issued US Civil Space Policy, which is largely infused with the concept of making ready to do things in space, rather than going ahead and doing them — and there is a big difference between the two.

Thus, there is a reference to continuing "R&D necessary to provide the basis for later programmatic decisions," and a call for a research strategy that "provides short-term flexibility to impose fiscal constraints when conditions warrant." And, not at all in the spirit of the high frontier, the space policy declares, "It is neither feasible nor necessary at this time to commit the United States to a high-challenge space engineering initiative comparable to Apollo. As the resources and manpower requirements for shuttle development phase down," it continues, "we will have the flexibility to give greater attention to new space applications and exploration, continue programs at present levels or contract them. To meet the objectives specified above, an adequate Federal budget commitment will be made."

Finally, in tracing the R&D mood of this Administra-

tion, we must not neglect HEW Secretary Joseph A. Califano Jr. and the vast exercise he has initiated to develop a five-year budget plan for biomedical research (SGR Vol. VIII, No. 17). Apart from the fact that Congress doesn't like to commit itself to long-term spending schemes, the Califano plan is noteworthy for its basic premise, i.e., that biomedical research must accommodate to austerity, even to the point of neglecting important research opportunities.

Now, given the Secretary's commitment to all-out war on rising medical costs, it must be observed that there is a sparsity of good sense in squeezing that tiny slice of the HEW health budget — \$2.6 billion out of \$37 billion — that is devoted to research on disease. While some medical research does, indeed, lead to an increase in health-care costs (as the formerly untreatable becomes treatable), improved therapies do frequently reduce the cost of treating illness. Nevertheless, in the commanding tone of a voice from Olympus, Califano proclaims: "It is a hard fact but a reality that not every area of basic research, perhaps not even every promising one, can be explored at once or with equal energy and equal commitment of resources."

Here, again, as with so much else in the Administration's R&D strategies, the issue is posed in terms of blank check versus prudent selectiveness.

Meanwhile, little or no recognition is given to the fact that, in the grand scheme of things, the research budget is relatively small — though not so, of course, the development budget. Nevertheless, by holding both parts of the budget to penny-pinching foreseeability requirements the effect is to deprive R&D of some of its essential characteristics — such as vitality, exuberance, adventuresomeness.

The Administration's desire for tight controls over R&D obviously derive from many awful past episodes when R&D entrepreneurs ran wild, and the US Treasury paid the costs. The quest for controls is also abetted by the fiscal conservatism that now envelopes the public process. What's necessary now, however, is to make certain that the remedies proposed for R&D finance and management are enlivening rather than paralyzing.

—DSG

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... France: R&D Shakeup Aims to Aid Industry

Paris. In a pattern that stretches from the People's Republic of China through virtually all of the western industrialized nations, France has embarked on a series of policy shifts aimed at promoting industrial prosperity from its investments in research and development.

The signal that something was in the works was evident in last spring's national elections, when all the competing parties took pains both to woo the research community and to promise that success at the polls would be followed by a major effort to establish more productive links between science and industry.

In the case of the victorious party of President Valery Giscard d'Estaing, the election promises were fairly vague, consisting mainly of a pledge "to infuse more science and innovation in industry" — without any specifics as to means and amounts.

That's what French science and industry have been waiting for these many months, and now, at last, the details are available, following lengthy negotiations and deliberations between the two government officials most directly involved: Pierre Aigrain, the Secretary of State for Research, and Andre Giraud, the Minister of Industry.

What they've worked out was approved September 13

by the Ministers Council, a presidentially chaired body whose decisions carry sufficient political power and solemnity to make everyone take notice. And, since the Council last took notice of R&D and industry in 1975, its latest action is naturally deemed to be of especially great significance.

Among the newly announced policies, perhaps the most important is that a clearcut division has been established between the duties of the Secretary of State for Research and the Minister of Industry — thus ending, it is hoped, the administrative confusion and guerilla warfare that previously raged on their borderline.

Industry Minister Giraud is to assume responsibility for what he describes as a "national program for innovation," which, starting around the turn of the year, is to put stress on stirring industry toward new products and processes, rather than, as in the past, just simply boosting the quantity of research. As Giraud puts it, the aim is to "mobilize the creativity of the country so as to satisfy the demands of the future."

To help achieve that goal, his ministry will be given authority over some of the development funds that pre-

(Continued on Page 4)

NSF Inaugurates a Share-the-Instruments Program

There was a time when any self-respecting scientist deemed it essential that the commonplace apparatus of his or her trade be located right there on the research premises. When you need it, you need it at once, they regularly said.

No doubt it's more convenient that way. But tight money and the costly sophistication of modern-day instrumentation has given the National Science Foundation a different view of the matter. And NSF has consequently inaugurated a share-the-instruments program that has far-reaching implications for both institutional prestige and the day-to-day conduct of research.

Under the title of Regional Instrumentation Facilities, the program, in its initial phase, is dividing some \$3.5 million (including \$500,000 from the Department of Energy) among six universities to buy and operate instruments that are to be shared by nearby institutions.

Under the program, facilities for nuclear magnetic resonance spectroscopy will be established at Colorado State and South Carolina. Mass spectrometry facilities will be established at Johns Hopkins and Nebraska. The University of Pennsylvania will be the site of a new laser facility and the University of Arizona will establish a facility for carbon-14 dating

and trace analysis by accelerator techniques.

According to an NSF announcement, the program is "designed to provide more scientific opportunities for institutions by sharing instruments . . . [and] to improve geographic distribution of basic research in this country and to enhance research and development interaction among university, industry, and government scientists and engineers." The announcement added that "Regional facilities featuring such instrumentation are thought to offer a solution to the problem of [instrument cost and obsolescence] by making costly instruments widely available to qualified scientists, including those at smaller institutions."

What was not noted was that the competition for these awards was indeed intense, and that the inclusion of some scientifically less-renowned institutions on the winners' list does not sit well with several elite competitors. Caltech, for example, is said to be incredulous at NSF's decision to select South Carolina, rather than Caltech, for one of the spectrometry facilities. Rumblings have been raised about political interference, but NSF insists that the awards were based purely on regional need and the potential for running a scientifically productive center.

... French Research Agencies Face "Audits"

(Continued from Page 3)

viously were controlled by the Delegation Generale à la Recherche Scientifique et Technique (DGRST), a cabinet-level coordinating body that comes under Aigrain's office. The change has been quickly endorsed by the Minister of the Budget, who shifted some \$70 million from the DGRST — which is dominated by academics — to the Ministry of Industry, which is more engineering oriented.

To grasp the significance of this shift, it is useful to recognize that in France, graduate education in the sciences is confined to universities, whereas engineering education mainly takes place in separate technical institutions, which serve as training grounds for industry. Thus, the transfer of resources from DGRST to the Ministry of Industry represents a solid victory for the technical-industrial lobby. One direct consequence is expected to be a shift away from DGRST's preference for putting development funds into big high-technology enterprises; small and medium-size firms will now stand a better chance of sharing in this assistance.

Aigrain, for his part, has issued a major research policy statement, which declares that "it is absolutely necessary to adapt research organizations to the needs of our economic and social progress in accordance with the imperatives of complexity, independence, and technological development" appropriate for French requirements. The first step concerns employment policies for scientists — traditionally a thorny issue in this country's heavily unionized and politicized scientific community.

The subject is an especially difficult one in view of statutory guarantees for lifelong jobs that accompany much scientific employment in France, to the detriment of performance standards and job mobility.

Coming out of the meeting of the Council of Ministers, Aigrain said, "I don't aspire to popularity," adding that he aims to increase the mobility and availability of scientists in response to where their talents can be most usefully applied. In his view, Aigrain insisted, "It is impossible, all their lifelong, for scientists to be working on the same research theme, and there is no automatic right to stay in the same laboratory."

Up until now, however, the movement of scientists from one government laboratory to another has been extremely limited — usually on a short-term, visiting basis. And private industry tends to make little use of fundamental scientists. Not only will industry have to revise its attitudes, but there will also have to be changes among scientists and their unions, both of which regard industrial employment as unseemly for fundamental researchers. Since present plans — unchanged, so far, by the new policies — call for creating about 600 new jobs in the public labs next year, the scientist and student

unions feel little sympathy for Aigrain's thrust toward steering government scientists into industrial positions.

Aigrain has also announced that he plans to shake up the government's R&D organizations. In regard to the National Center for Scientific Research (CNRS), the biggest research agency in France, he is calling for its division into a number of separate agencies built around specific objectives. He also wants the research organizations to be subjected to periodic "scientific audits" to assess their quality and productivity, though the criteria for this system have not yet been specified. In the life sciences, however, a financier, Pierre Mayer, has been designated to work out evaluation procedures, and, needless to say, this has aroused controversy and anxiety among the affected scientists.

But, to show its determination, the government has ordered a first audit of the National Institute for Agricultural Research — to be carried out by the general director of the French railway system. Inevitably, this move has been strongly condemned by the National Union of Scientific Researchers.

The newly announced policies mean the end of the so-called grand programs, a de Gaulle-era specialty that has managed to hold on. It was by virtue of these programs that France embarked on such grandiose ventures as Concorde, launch-vehicle autonomy for space, and similarly ambitious attempts to make the big leagues in computer technology under the Plan Calcul. These programs consumed a large proportion of the national R&D budget, with sparse results. Now preference is to be given to nourishing a broad spectrum of economic activity through public R&D investment with emphasis on assisting smaller enterprises; the big firms in high technology will increasingly be expected to rely on their own funds.

All in all, French R&D has gone through a major shakeup, but it is still too early to say whether the changes are cosmetic or fundamental. Aigrain's reform efforts have already stirred strong opposition in the scientific community. The Minister for Universities has chimed in with support for Aigrain's criticisms of

(Continued on Page 5)

Federal Publication Bibliography

Available without charge: *Consumers Guide to Federal Publications*, a bibliography of the bibliographies that encompass the 25,000 or so publications of one sort or another issued and on sale by the US Government. Address orders to: C. A. La Barre, Assistant Public Printer, Superintendent of Documents, Government Printing Office, Washington, DC 20401.

Britain: Bracing for the Microprocessor Era

London. Mention chips to an Englishman these days and there is a good chance that he will think you are talking about electronic components rather than our traditional accompaniment to fried fish. Semiconductor mania seems to have hit the country — with politicians from the Prime Minister downwards making speeches about the need for a British microelectronics industry and with the trade unions confused about the likely impact of the semiconductor revolution.

The latest official manifestation of this new-found interest is a report by the Advisory Council for Applied Research and Development (ACARD). The report, the first of three on the semiconductor industry and its implications, looks at the applications of semiconductor technology. The working party that wrote the report was chaired by Bob Clayton, technical director of the UK's General Electric Company, Britain's biggest firm in the electrical engineering and electronics business.

According to the report, "Over the next 10-15 years there will be changes in both manufacturing and service industry which will affect the whole United Kingdom economy." However, it points out, British industry seems to be in a state of blissful ignorance of this impending revolution. The government department responsible for overseeing this sector of industry as well as many of those industries that will be affected by semiconductors, the Department of Industry, estimates that only five per cent of UK firms are aware of semiconductor technology and are exploiting it.

ACARD says that its overwhelming impression is that awareness of the effects of the semiconductor technology in industry is inadequate and this poses a threat to the competitiveness of UK industry.

ACARD, which was set up to advise the government

FRANCE (Continued from Page 4)

scientific immobility, but so far has done nothing of a substantive nature in regard to the problem.

The main test of the new R&D policies will be in terms of financial resources to meet the costs of the newly announced reforms. In this respect, the situation is far from clear. Government funds for R&D have been on a downward slope since 1969, though there was a brief improvement in 1977. And even Aigrain concedes that, while the trend can be stopped, it cannot be reversed in the short-term. The budget forecasts for 1979, following the usual complex deliberations among all parties, show an increase of only 10.2 per cent in constant money — which is smaller than the rate of inflation. About the only bright spot is that for the first time in many years, basic research expenditures will grow faster than overall R&D spending, thanks, apparently, to the abandonment of the great programs. —FS

on the whole of applied R&D, says that it believes in "a national technology strategy; that is, the naming of products and services with greatest potential for national benefit, for example through exports, or because of widespread impact through industry, and preferential Government assistance for these areas through purchasing, R&D and finance. The aim of the strategy must be to avoid spreading resources too thinly. Support for semiconductor applications must be an essential part of such a plan."

The report says that government departments and nationalized industries should be treated as "guinea pigs" for advances in semiconductor technology and they should accept that some failures are inevitable. In general the Council wants the government to do anything it can — from training workers, through supporting consultancy services, to aiding the development and launching of new products and services. And where the government does have schemes in different industrial sectors to help companies make and launch new products "emphasis should be given to those which involve the application of semiconductor technology. It is important that Government should give preference to the new, technologically oriented industries which will be the foundation of our future manufacturing base."

Clearly the Council wants to make the semiconductor industry a special case, though it recognizes that this could be costly. In July Eric Varley, the Industry Secretary, announced a \$30-million scheme "to encourage UK industry to apply microprocessor techniques to a wide range of products and production processes." And the promise is that more money will be made available if the trial scheme is a success. The government has also decided to fund the component manufacturers. Among other products it will support is a new microelectronics company that will make the advanced circuits needed for industry to take part in the semiconductor revolution.

(Continued on Page 6)

New Math Journal Published

A new journal, *The Mathematical Intelligencer*, which "aims to serve a similar purpose for mathematics as *Nature*, *Science* and the *New Scientist* serve for other areas of the exact sciences," has been published by Springer-Verlag, an international scientific publishing company.

To be issued quarterly, the journal is edited by Bruce Chandler, College of Staten Island, City University of New York; Harold Edwards, of New York University, is managing editor. Annual subscriptions are available for \$9.50, prepaid, from: Springer-Verlag New York, Inc., 175 Fifth Ave., New York, N.Y. 10010.

HEW Establishes Nutrition Coordination Post

George A. Bray, professor of medicine at the UCLA School of Medicine, has been appointed Nutrition Policy Coordinator of the Department of Health, Education, and Welfare.

Bray will serve on the staff of Julius Richmond, Assistant Secretary for Health, and, according to an HEW announcement, "will be responsible for co-ordinating HEW policy in nutrition research, nutrition education, regulation of additives and fortification of foods, nutrition manpower development, delivery of nutrition services, nutrition standards and the surveillance of nutritional status."

The appointment reflects Washington's growing fascination with nutrition, which mainly originates in Congressional prodding on the subject. Symptomatic of this is a newly issued report by the Congressional

Office of Technology Assessment, *Nutrition Research Alternatives*, which concludes "that the Federal Government has failed to adjust the emphasis of its human nutrition research activities to deal with the changing health problems of the people of the United States. The consequences of continuing to pursue the present preoccupation with nutritional deficiency diseases will seriously affect the quality of life of present and future generations into the 21st century."

(Copies of *Nutrition Research Alternatives*, 77 pages, are available for \$2.75 each from the US Government Printing Office, Washington, DC 20401. It is not unlikely that your Congressman, eager to be of service in the weeks preceding election day, can get you one gratis from OTA.)

... British Unions Wary of Effects on Jobs

(Continued from Page 5)

tion (SGR, Vol VIII, No. 12). And now the ACARD report says that a further \$200 million may be needed to help industry adapt to these new devices.

If nothing else all the talk of an impending semiconductor revolution has jolted many companies and unions into considering the likely impact of microprocessors on them. The responses range from those unions who feel that the new technology will lead to massive unemployment to those who see it as a way of saving jobs. The subject even made the agenda of this year's annual delegate meeting of the Trades Union Congress — Britain's equivalent to the AFL-CIO — a rare event, indeed, as the unions hardly ever worry themselves about technological matters. The TUC wants to see more public ownership and investment in the industry as well as planned job creation and a shorter working life in an attempt to ameliorate any adverse effects on employment. One union, the Technical Administrative and Supervisory Section (TASS) of the Amalgamated Union of Engineering Workers, has already reached an agreement with the British offshoot of the Ford Motor Company imposing stringent "no redundancy and no speed-up" conditions on the introduction of computers over a wide range of applications.

The fears of the unions were summed up at a conference on computer technology and employment organized by TASS in September. At the conference, the general secretary of the General and Municipal Workers' Union, one of Britain's biggest, predicted that semiconductor technology could mean "massive redundancy

of jobs in the production and white-collar sectors" of industry.

However, at the same meeting, the Secretary of State for Employment, Albert Booth, warned that it could be disastrous for the country if Britain did not apply microelectronic technology in its industries. According to Booth: "There is no certainty about job loss if we do apply microelectronic technology. There is absolute certainty about job loss if we do not." He sees today's fears as a response to the current economic climate. "We inevitably look at new technology somewhat fearfully and timidly when we look at it in a period of recession. Economists generally take the view that growth in productivity is invariably associated with a growth in employment. Perhaps it is not too optimistic to suggest that the productivity gains that microelectronic technology can bring us can help the advanced economies out of recession and restore the pattern of fast economic growth that characterized their performance throughout the 1950s and 1960s."

The key to Britain's success in applying microelectronics in industry is seen by many as indigenous production of the sophisticated semiconductor components. Here the government has said that it will consider investing some \$100 million in a company to make components. This company, Inmos, would be supported by the National Enterprise Board. The company has yet to find a home — several local authorities are angling for the opportunity to house the organization — but already it is surrounded by controversy. Inmos will rely

(Continued on Page 7)

Carter Appoints Seven to Science Board

Overlooked with many other items in the 95th Congress's stampede to adjourn in mid-October was confirmation of a batch of Presidential appointments to the National Science Board, the 24-member policymaking body of the National Science Foundation. The appointees, all nominated for six-year terms, will serve as consultants while awaiting the next Congress's approval, which is a routine matter. The nominees are:

Lewis M. Branscomb, Vice President and Chief Scientist, International Business Machines, Inc., Armonk, New York

Eugene H. Cota-Robles, Vice Chancellor and Professor of Biology, University of California at Santa

Cruz

Ernestine Friedl, Professor of Anthropology, Department of Anthropology, Duke University

Walter E. Massey, Dean of the College and Professor of Physics, Brown University

David V. Ragone, Dean of the College of Engineering, University of Michigan

Edwin E. Salpeter, J. G. White Professor of Physical Sciences, Cornell University

Charles P. Slichter, Professor of Physics and in the Center for Advanced Study, University of Illinois at Urbana

Slichter has completed a partial term on the Board and was renominated for a full term.

BRITAIN (Continued from Page 6)

heavily on both US technology and even US production in its early days. Two of the three founders of Inmos are from the US and the Texas-based Mostek company is fighting in the courts to prevent Inmos "expropriating" its technology.

As if that were not enough to get Inmos off to a difficult start, other companies have done their best to pour cold water on the whole idea. The British General Electric Company has said that it will be in the market supplying components long before Inmos, thanks to an agreement it has signed with the US electronics company Fairchild. Both GEC and Fairchild have agreed to provide half the \$40 million or so needed to set up new production facilities.

Another blow to Inmos came from Texas Instruments, which early in September announced that it too

has an overwhelming lead over the proposed British company. Inmos pins its faith on the next generation of semiconductor computer chips, with 64 k memories — four times as much as today's devices — and TI says that it, and other companies, could be mass producing these devices next year. Inmos cannot hope to have similar devices on the market until 1981, by which time the companies with established products will be selling at extremely low prices, too low for Inmos to be able to compete.

So once again the government is being criticized for intervening in a new industry in the wrong way. However, the move to support electronics is not just an isolated case of the Department of Industry suddenly latching on to a fashionable subject. For years now, the government has been criticized for promoting the wrong sort of R&D. The aerospace and nuclear energy sectors have taken the lion's share of Britain's industrial R&D funds, but their importance to the country has not been commensurate with the cost. Now a shift is underway towards those sectors that contribute more to the country's output. Thus engineering and electronics will receive a larger share of the funds available for R&D. And the support of the microprocessor industry is one sign of this switch in priorities. — MK

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Ethics Bibliography Published

The 1979-80 edition of *Bibliography of Society, Ethics and the Life Sciences* is available for \$5 per copy from The Hastings Center, Publications Department, 360 Broadway, Hastings-on-Hudson, New York 10706.

Among the topics covered in the 87-page publication are behavior control, experimentation and consent, health-care delivery, and population and birth control.

The Hastings Center is home base for the Institute of Society, Ethics and the Life Sciences, which was founded in 1969.

NIH: Final Returns on the 1979 Budget

Herewith, institute by institute, plus a few other components, is the final Congressional reckoning on money for the National Institutes of Health for the current fiscal year, which began October 1. Overall, it will be seen, the Congress added \$312.7 million to the Administration's research request, a seemingly plump amount, but, in percentage terms, a small addition compared to what it did in past years. On a year-to-year basis, the new budget shows a \$359.2 million growth in research funds — which is in line with the Administration's quest to keep basic research spending a bit ahead of inflation, but not by much.

In regard to policy implications, the final numbers show a marked slowdown in the growth of both the Cancer Institute and the Heart, Lung and Blood Institute, which together take up about half the research budget. What the bottom line indicates is that the Administration and Congress now agree that it's time to concentrate growth in some of the institutes that suffered while Cancer and Heart thrived. Perhaps the most important conclusion to be drawn from the figures is that biomedical research retains Congressional favor but the days of heaping funds atop the Administration request are yet to return, if ever.

	Fiscal year 1978 comparable appropriation	Fiscal year 1979 budget estimate	House bill	Senate bill	Fiscal year 1979 conference agreement	Conference compared to fiscal year 1978	Conference compared to 1979 estimates	Conference compared to House bill	Conference compared to Senate bill
National Cancer Institute	\$851,800,000	\$858,392,000	\$889,192,000	\$937,500,000	\$917,000,000	\$+ 65,200,000	\$+ 58,608,000	\$+ 27,808,000	\$-20,500,000
National Heart, Lung, and Blood Institute	424,927,000	432,184,000	485,584,000	485,584,000	485,584,000	+ 60,657,000	+ 53,400,000		
National Institute of Dental Research	57,473,000	57,841,000	63,841,000	60,000,000	61,920,000	+ 4,483,000	+ 4,079,000	-1,921,000	+ 1,920,000
National Institute of Arthritis, Metabolism, and Digestive Diseases	243,269,000	249,369,000	287,869,000	287,869,000	287,869,000	+ 44,600,000	+ 38,500,000		
National Institute of Neurological and Communicative Disorders and Stroke	170,932,000	173,610,000	188,910,000	225,000,000	205,000,000	+ 34,068,000	+ 31,390,000	+ 16,090,000	-20,000,000
National Institute of Allergy and Infectious Diseases	154,943,000	159,798,000	183,198,000	183,198,000	183,198,000	+ 28,255,000	+ 23,400,000		
National Institute of General Medical Sciences	196,298,000	185,092,000	225,092,000	230,000,000	231,058,000	+ 34,760,000	+ 45,966,000	+ 5,966,000	+ 1,058,000
National Institute of Child Health and Human Development	91,124,000	108,855,000	119,005,000	109,605,000	114,305,000	+ 23,181,000	+ 5,450,000	-4,700,000	+ 4,700,000
National Institute on Aging	34,863,000	35,926,000	54,526,000	49,500,000	54,526,000	+ 19,663,000	+ 18,600,000		+ 5,026,000
National Eye Institute	80,694,000	82,449,000	100,549,000	100,549,000	100,549,000	+ 19,855,000	+ 18,100,000		
National Institute of Environmen- tal Health Sciences	58,644,000	63,927,000	73,227,000	70,000,000	73,512,000	+ 14,868,000	+ 9,585,000	+ 285,000	+ 3,512,000
Research resources	144,531,000	148,499,000	152,899,000	153,899,000	153,649,000	+ 9,118,000	+ 5,150,000	+ 750,000	-250,000
John E. Fogarty International Center	8,459,000	8,489,000	8,789,000	8,989,000	8,989,000	+ 530,000	+ 500,000	+ 200,000	
Subtotal biomedical research	2,517,921,000	2,564,431,000	2,832,681,000	2,901,693,000	2,877,159,000	+ 359,238,000	+ 312,728,000	+ 44,478,000	-24,534,000
National Library of Medicine	29,521,000	31,787,000	31,887,000	35,000,000	33,444,000	+ 3,923,000	+ 1,657,000	+ 1,557,000	-1,556,000
Office of the Director	18,871,000	19,373,000	19,673,000	19,673,000	19,673,000	+ 802,000	300,000		
Buildings and facilities	65,650,000	30,950,000	67,950,000	67,950,000	67,950,000	+ 2,300,000	+ 37,000,000		
Subtotal, National Institute of Health	2,631,963,000	2,646,541,000	2,952,191,000	3,024,316,000	2,998,226,000	+ 366,263,000	+ 351,685,000	+ 46,035,000	-26,090,000

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